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Table C-18A
Reporting Limits for EPA Method 300.0, Anions By Ion Chromatography

Water Quality Parameters	RL (water) mg/L
Common anions by IC:	
Chloride	3
Nitrite-N	0.4
Bromide	0.5
Nitrate-N	0.6
o-Phosphate-P	1
Sulfate	1

Notes:
IC = ion chromatography
mg/L = milligrams per liter
RL = reporting limit

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Table C-18B
Quality Control Acceptance Criteria for EPA Method 300.0, Anions By Ion Chromatography

Analyte	LCS/LCSD Accuracy (%R)	MS/MSD Accuracy (%R)	Precision (water) (RPD)
Common anions by IC:			
Chloride	80-120	75-125	≤20
Nitrite-N	80-120	75-125	≤20
Bromide	80-120	75-125	≤20
Nitrate-N	80-120	75-125	≤20
o-Phosphate-P	80-120	75-125	≤20
Sulfate	80-120	75-125	≤20

Notes:
IC = ion chromatography
LCS/LCSD = laboratory control sample/laboratory control sample duplicate
MS/MSD = matrix spike/matrix spike duplicate
%R = percent recovery
RPD = relative percent difference

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Table C-18C
Summary of Quality Control Acceptance Criteria for EPA Method 300.0, Anions by Ion Chromatography

Quality Control Check	Minimum Frequency	Acceptance Criteria	Corrective Action
Multipoint calibration for all analytes (minimum 3 standards and one calibration blank)	Initial calibration prior to sample analysis	Correlation coefficient ≥ 0.995 for linear	Correct problem, then repeat initial calibration
Calibration verification	Daily, when anion eluent is changed and after every 20 samples	All analytes within ±10% of expected value	Correct problem, repeat continuing calibration check analysis, if still out of criteria, repeat initial calibration and reanalyze associated samples

Table C-18C
Summary of Quality Control Acceptance Criteria for EPA Method 300.0, Anions by Ion Chromatography

Quality Control Check	Minimum Frequency	Acceptance Criteria	Corrective Action
Second-source calibration verification	Once per multipoint calibration	All analytes within ±10% of expected value	Verify calculations & standard preparation; repeat second source standard check analysis, if still out of criteria, repeat initial calibration and reanalyze associated samples
Method blank	One per analytical batch	No analytes detected ≥ RL	Correct problem, then reanalyze method blank and all samples associated with the contaminated blank
Retention Time Window	Calculated for each analyte per analysis sequence	Within the calculated retention time window	Correct the problem and reanalyze sample
Laboratory Control Sample (LCS) for all analytes	One LCS per analytical batch If MS/MSD not requested, a LCSD must also be analyzed.	Must meet QC acceptance criteria, Table C-18B	Correct problem then reprep and analyze the LCS and all samples in the analytical batch
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	As specified on the COC.	Must meet QC acceptance criteria, Table C-18B	Check for calculation errors, check standard & sample preparation documentation. Evaluate matrix effects, if necessary, correct problem and reanalyze the MS/MSD and associated sample
Method Detection Limit (MDL) study	Annually	MDLs will be generated in accordance with 40 CFR 136 Appendix B. MDLs shall be less than the RL. In the event that the MDL is not less than ½ of the RL, the CH2M HILL project chemist will be contacted.	The CH2M HILL project chemist will review MDLs and approve/disapprove suggested MDL changes which are not less then ½ of the RL.
MDL Verification Standard analyzed at approximately two times the calculated MDL	To be performed as part of every MDL study	The MDL is verified if the check standard produces a response at 3 times above the instrument's noise level, and greater than the blank associated with the MDL verification study.	If verification response is too low, spike at successively higher concentrations until criteria are met, and use the first successful concentration as the reported MDL.
Results reported between MDL and RL	None	"J" flag estimated data	None

Notes:
LCS = laboratory control sample
MDL = method detection limit
MS/MSD = matrix spike/matrix spike duplicate
QC = quality control
RL = reporting limit

Dioxin Reporting Limits and Method Detection Limits (MDLs) for SW846

Each HRGCMS method has general reporting limits and detection limits determined by the method; however, actual detection limits will vary by matrix and sample due to a number of factors impacting the analytical process. The current method detection limits (MDLs) available for EPA Methods 8280A and 8290 are listed below:

Specific Isomer	Compound Name	Hi Res		Low Res	
Dioxin:		Water (ppq)	Solid (ppt)	Water (ppt)	Solid (ppb)
2378	TCDD Tetrachlorodibenzo-p-dioxin	10	1	10	1
12378	PeCDD Pentachlorodibenzo-p-dioxin	50	5	25	2.5
123678	HxCDD Hexachlorodibenzo-p-dioxin	50	5	25	2.5
123478	HxCDD Hexachlorodibenzo-p-dioxin	50	5	25	2.5
123789	HxCDD Hexachlorodibenzo-p-dioxin	50	5	25	2.5
1234678	HpCDD Heptachlorodibenzo-p-dioxin	50	5	25	2.5
12346789	OCDD Octachlorodibenzo-p-dioxin	100	10	50	5
Furan:					
2378	TCDF Tetrachlorodibenzofuran	10	1	10	1
12378	PeCDF Pentachlorodibenzofuran	50	5	25	2.5
23478	PeCDF Pentachlorodibenzofuran	50	5	25	2.5
123678	HxCDF Hexachlorodibenzofuran	50	5	25	2.5
123789	HxCDF Hexachlorodibenzofuran	50	5	25	2.5
123478	HxCDF Hexachlorodibenzofuran	50	5	25	2.5
234678	HxCDF Hexachlorodibenzofuran	50	5	25	2.5
1234678	HpCDF Heptachlorodibenzofuran	50	5	25	2.5
1234789	HpCDF Heptachlorodibenzofuran	50	5	25	2.5
12346789	OCDF Octachlorodibenzofuran	100	10	50	5

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Table C-17A
Reporting Limits for SW-846 Methods 6020 for Metals

Analyte	Water	
	RL	Unit
Antimony	2	µg/L
Arsenic	1	µg/L
Barium	1	µg/L
Beryllium	1	µg/L
Cadmium	1	µg/L
Chromium	2	µg/L
Cobalt	1	µg/L
Copper	1	µg/L
Lead	1	µg/L
Manganese	1	µg/L
Nickel	1	µg/L
Selenium	5	µg/L
Silver	1	µg/L
Thallium	0.3	µg/L
Vanadium	1	µg/L
Zinc	10	µg/L

Notes:
RL = reporting limit
µg/L = micrograms per liter

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Table C-17B
Summary of Quality Control Acceptance Criteria for Metals

Quality Control Check	Minimum Frequency	Acceptance Criteria	Corrective Action
MS tuning sample	Prior to initial calibration and calibration verification	SW-846 method 6020, paragraph 5.8	Retune instrument then reanalyze tuning solution
Initial Calibration- minimum one standard and a blank	Daily initial calibration prior to sample analysis	If more than one standard is used correlation coefficient must be >0.995	If applicable correct problem then repeat initial calibration
Initial Calibration Verification (ICV) - second source standard	After every initial calibration and before any sample analysis	All analytes within control limits of: Metals 90-110% recovery	Correct problem then repeat calibration and verification
Continuing Calibration Verification (CCV) Standard – Must be at the mid-range of the curve	Before beginning a sample run, at a frequency of 10%, or every 2 hours during the analysis sequence (whichever is more frequent), and at the end of the analysis sequence	All analytes within control limits of: ICP 90-110% recovery	Correct problem, recalibrate, verify, then reanalyze all samples since last successful calibration
RL-type Standards for ICP MS (CRI)	Beginning and end of each ICP MS analytical run and at 1/20 samples (after the ICV but before the ICS)	50-150% should be used as advisory limits	Locate and fix problem with system and then rerun calibration, ICV, and CCV for those analytes that did not meet criteria
Calibration Blank	Before beginning a sample run, after every 10 samples and at the end of the analysis sequence	No analytes detected ≥ RL; report results ≥ MDL	If analytes are ≥ RL, correct problem, recalibrate, verify, then reanalyze all samples since last compliant calibration blank

Table C-17B
Summary of Quality Control Acceptance Criteria for Metals

Quality Control Check	Minimum Frequency	Acceptance Criteria	Corrective Action
Method Blank	One per preparation batch or SDG (whichever is more frequent)	No analytes detected ≥ RL	Correct problem reprep and analyze method blank and all samples processed with the contaminated blank
ICP Interference Check Sample Analyses (ICSA and ICSAB)	At the beginning and end of an analytical run or twice during a 12 hour period, whichever is more frequent	ICS-A All non-spiked analytes < RL unless they are a verified trace impurity from one of the spiked analytes ICS-AB Within plus or minus 20% of the true value	Terminate analysis; locate and correct problem; reanalyze ICS; reanalyze all affected samples
Matrix spike and Matrix Spike Duplicate (MS/MSD)	As specified on the COC.	80-120% recovery with less than or equal to 15% for RPD	none
Internal Standards (ISs)	Every sample	IS intensity within 30-120% of intensity of IS in the initial calibration	Perform corrective action as described in method SW846 6020, section 8.3
Dilution Test	Each preparatory batch	1:5 dilution must agree within plus or minus 10% of the original determination	Perform post digestion spike addition.
Post Digestion Spike Addition	When dilution test fails	Recovery within 75 – 125% of expected results	Dilute the sample; reanalyze post digestion spike addition
Laboratory Control Sample (LCS) Analysis Laboratory Control Sample Duplicate (LCSD) required as specified	One LCS per digestion batch. If MS/MSD not requested, LCSD must be analyzed	80-120% recovery for aqueous samples with RPD less than or equal to 15	Correct problem then reprep and reanalyze the LCS and all samples in the affected batch
Method Detection Limit (MDL) study	Annually	MDLs will be generated in accordance with 40 CFR 136 Appendix B. MDLs shall be less than the RL. In the event that the MDL is not less than ½ of the RL, the CH2M HILL project chemist will be contacted.	The CH2M HILL project chemist will review MDLs and approve/disapprove suggested MDL changes which are not less then ½ of the RL.
MDL Verification Standard analyzed at approximately two times the calculated MDL	To be performed as part of every MDL study	The MDL is verified if the check standard produces a response at 3 times above the instrument's noise level, and greater than the blank associated with the MDL verification study.	If verification response is too low, spike at successively higher concentrations until criteria are met, and use the first successful concentration as the reported MDL.
Instrument Detection Limit (IDL) Determination	Initial, then quarterly	Detection limits established shall be less than or equal to ½ the RLs.	None
Results reported between MDL and RL	None	"J" flag estimated data (spectra must meet identification criteria)	None

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Notes:
CCV = continuing calibration verification
CFR = Code of Federal Regulations
ICP = inductively coupled plasma
ICS = interference check sample
ICSA = interference check sample A
ICSAB = interference check sample AB
ICV = initial calibration verification
IDL = instrument detection limit
IS = Internal Standard
LCS = laboratory control sample
MDL = method detection limit
MS/MSD = matrix spike/matrix spike duplicate
QC = quality control
RL = reporting limit
RPD = relative percent difference
SDG = sample delivery group

Table C-15A
Reporting Limits for SW-846 Methods 6010B, 7000 Series for Metals

Analyte	Water	
	RL	Unit
Aluminum	200	µg/L
Antimony	6	µg/L
Arsenic	10	µg/L
Barium	200	µg/L
Beryllium	4	µg/L
Boron*	110	µg/L
Cadmium	5	µg/L
Calcium	5000	µg/L
Chromium	10	µg/L
Cobalt	50	µg/L
Copper	25	µg/L
Iron	100	µg/L
Lead	3	µg/L
Magnesium	5000	µg/L
Manganese	15	µg/L
Mercury	0.2	µg/L
Molybdenum*	20	µg/L
Nickel	40	µg/L
Potassium	5000	µg/L
Selenium	5	µg/L
Silica (SiO2)*	110	µg/L
Silver	10	µg/L
Sodium	5000	µg/L
Thallium	2	µg/L
Vanadium	50	µg/L
Zinc	20	µg/L

Notes:
RL = reporting limit
µg/L = micrograms per liter
* = to be analyzed only upon request

Table C-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Analysis [a]	Analytical Methods	Container [b]	Preservation [c,d]	Minimum Sample Volume or Weight [e]	Maximum Holding Time [f]	
Volatile Organic Compounds	EPA 524.2, SW846/8260B (water)	G (VOC vial), Teflon-lined septum	Off site: Cool, 4°C, HCl to pH < 2, no headspace. On-site: Cool, 4°C, no headspace.	3 x 40 mL vials- EPA 524.2; 3 x 40 mL vials- SW846/8260B	14 days if preserved; 7 days if unpreserved	
Volatile Organic Compounds	SW846/8260B; prep method SW846/5035 (soil/sediment)	EnCore® sampler	Sampler: Cool, 4°C	3 x EnCore® samplers	48 hours if only cooled to 4°C 48 hours for Encore® or equivalent samplers unless extruded and preserved within 48 hours as follows: • Frozen • Sodium bisulfate • Methanol 14 days for extruded and preserved samples.	Rev.
Volatile Organic Compounds	SW846/8260B Selective Ion Monitoring (SIM) (Biota/cranberries)	16-oz glass jar, Teflon-lined cap	Freeze	2 16-oz glass jars per sample	1 year frozen	
Volatile Organic Compounds	TO-15 (air)	6-liter Summa® Canister	Not applicable	Not applicable	30 days	Rev.
Volatile Petroleum Hydrocarbons	MassDEP Method for the determination of Volatile Petroleum Hydrocarbons (water)	Glass vial, Teflon-lined septum	Cool, 4°C, HCl to pH<2, no headspace	3 x 40 mL vials	14 days	Rev.
Volatile Petroleum Hydrocarbons	MassDEP Method for the determination of Volatile Petroleum Hydrocarbons (soil/sediment)	Glass vial, Teflon-lined septum; or EnCore® sampler	Glass vials: Cool, 4°C, 1 mL methanol for every 1 gram of soil/sediment (approximately 15 mL methanol per vial) Or EnCore® sampler: cool, 4°C	Glass vials: 2 x 40 mL vials with approximately 15 grams of sample in each vial** Or 5-25 g EnCore® sampler(s)**	28 days for samples collected in vials pre-preserved with methanol; Or 28 days for samples collected using Encore® samplers extruded and preserved in methanol within 48 hours of collection	Rev.
Extractable Petroleum Hydrocarbons	MassDEP Method for the determination of Extractable Petroleum Hydrocarbons (water)	Glass amber bottle, Teflon-lined screw cap	Cool, 4°C, HCl to pH<2	2 x 1 L bottles	Samples must be extracted within 14 days and extracts must be analyzed within 40 days after extraction	Rev.

Table C-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Analysis [a]	Analytical Methods	Container [b]	Preservation [c,d]	Minimum Sample Volume or Weight [e]	Maximum Holding Time [f]	
Extractable Petroleum Hydrocarbons	MassDEP Method for the determination of Extractable Petroleum Hydrocarbons (soil/sediment)	Glass amber wide-mouth jars, Teflon-lined screw cap	Cool, 4°C	1 x 4-oz. jar	Samples must be extracted within 14 days and extracts analyzed within 40 days of extraction.	Rev.
Ethylene Dibromide (EDB) and/or 1,2-Dibromo-3-chloropropane (DBCP)	504.1 (water)	G, Teflon-lined cap	Cool, 4°C; $Na_2S_20_3$	3 x 40 mL	14 days until extraction with analysis to follow immediately after extraction; 7 days until extraction if unpreserved	
Semivolatile Organic Compounds	SW8270C (water)	G (amber), Teflon-lined cap	Cool, 4°C	2 L	7 days until extraction and 40 days after extraction	
Explosives (Nitroaromatics and Nitro-amines) by HPLC	SW846/8330 modified (water and soil)	G (amber), Teflon-lined cap	Water: Cool, 4°C Soil/sediment:: Cool, 4°C	Water: 2 L Soil: 50 grams	Water: 7 days until extraction and 40 days after extraction Soils/sediment: 14 days until extraction and 40 days after extraction	Rev.
Dioxins and Furans	SW8290 (water)	Glass amber, Teflon-lined cap	Cool, 4°C	2 Liters	30 days until extraction, and 45 days after extraction	Rev.
TCLP (VOC & metals)	SW846/1311, 8260B, 6010B, 7000A series (solid)	Nonvolatile extraction: G (amber), Teflon-lined cap Volatile extraction (ZHE): G (amber), Teflon-lined cap	Cool, 4°C, no headspace for volatile extraction	Nonvolatile extraction: 200 g Volatile extraction: 100 g	Volatiles: TCLP extraction 14 days, 14 days after extraction; mercury: TCLP extraction 28 days, 28 days after extraction; other metals TCLP extraction 180 days, 180 days after extraction	
Dissolved Gasses	EPA Region 1 Technical Guidance for Natural Attenuation Indicators	G	Cool, 4°C, HCl to pH < 2, no headspace	Water: 3 x 40 mL vials	Water: 14 days	
Metals (except mercury)	SW6010B, SW7000 Series	P or G	Water: HNO_3 to pH < 2	Water: 1 L	Water: 180 days	

Table C-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Analysis [a]	Analytical Methods	Container [b]	Preservation [c,d]	Minimum Sample Volume or Weight [e]	Maximum Holding Time [f]
Metals	SW6010B (soil/sediment)	P or G	Soil/sediment: Cool, 4°C	Soil/sediment: 50 g	Soil/sediment: 180 days
Metals (except mercury)	SW6020	P or G	Water: HNO_3 to pH < 2	Water: 1 L	Water: 180 days
Mercury	SW7470A	P or G	Water: HNO_3 to pH < 2	Water: 1 L	Water: 28 days
Common Anions (sulfate, bromide, nitrite, nitrate, orthophosphate, chloride)	E300.0 (water)	G	Cool, 4°C	50 mL	28 days for phosphorus, chloride, bromide, sulfate; 48 hours for nitrate, nitrite, orthophosphate
Alkalinity	E310.1	P or G	Cool, 4°C	50 mL	14 days
Ammonia-N	E350.1, E350.2 (water)	P or G	H_2SO_4 to pH < 2	1 L	28 days
Nitrate-N	E352 series (water)	P or G	Cool, 4°C	Water: 100 mL	Water: 48 hours
Nitrate/Nitrite-N	E353 series (water)	P or G	Cool, 4°C, H2SO4	Water: 100 mL	Water: 28 days
Total Kjeldahl Nitrogen (TKN)	E351 series** (water)	P or G	Water: H_2SO_4 to pH < 2	Water: 100 mL	Water: 28 days
Total Phosphorous	E365 series (water)	P or G	Water: H_2SO_4 to pH < 2	Water: 100 mL	Water: 28 days
Total Phosphorous	E365 series (soil/sediment)	P or G	Soil/sediment: Cool, 4°C	50 g	Soil/sediment: 28 days
Orthophosphate	E365 series (water)	P or G	Cool, 4°C	100 mL	48 hours
Sulfide	E376.1	P or G	NaOH to pH < 9, ZnOAc and Cool, 4°C, no headspace	500 mL	7 days
Filterable Residue (TDS)	E160.1 (water)	P or G	Cool, 4°C	500 mL	7 days
Nonfilterable Residue (TSS)	E160.2 (water)	P or G	Cool, 4°C	500 mL	7 days
Total Solids (TS)	E160.3 (water)	P or G	Cool, 4°C	500 mL	7 days
Total Volatile Solids (TVS)	E160.4 (water)	P or G	Cool, 4°C	100 mL	7 days
Hardness	E130.1, E130.2	P or G	HNO_3 to pH < 2, cool, 4°C	100 mL	6 months
BOD	E405.1 (water)	G	Cool, 4°C	1 L	48 hours

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Table C-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Analysis [a]	Analytical Methods	Container [b]	Preservation [c,d]	Minimum Sample Volume or Weight [e]	Maximum Holding Time [f]
COD	E410.4 (water)	P, G	H_2SO_4 to pH < 2, cool, 4°C	1 L	28 days
Total Organic Carbon (TOC)	E415.1, E415.2 (water)	P, G	HCl or H_2SO_4 to pH < 2, cool, 4°C	100 mL (3 X 40 ml vials)	28 days
TOC	SW9060 (solid)	G	Cool, 4°C	50g	28 days
Dissolved Inorganic Carbon (DIC) and Dissolved Organic Carbon (DOC)	E415.1, E415.2 (water)	P, G	Filter, HCl or H_2SO_4 to pH < 2, cool, 4°C	100 mL each parameter (3 X 40 ml vials)	28 days
Nitrate-Nitrite (low level)	SM4500-NO_3 F (water)	G	Cool, 4°C, H_2SO_4	250 mL	28 days
Nitrite-N (low level)	SM4500-NO_2 B (water)	G	Cool, 4°C	250 mL	48 hours
Ammonia-N (low level)	SM4500-NH_3 H (water)	G	Cool, 4°C, preserved at lab	250 mL	28 days if preserved
Orthophosphate (low level)	SM4500-P E (water)	G	Cool, 4°C	250 mL	48 hours unless preserved within 48 hours as follows: • Frozen 28 days for preserved samples.
Total Phosphorus (low level)	MCTNP (water)	G	H_2SO_4 to pH < 2, Cool, 4°C	125 mL	28 days
Total Phosphorus	SM4500-P F (water)	G	H_2SO_4 to pH < 2, Cool, 4°C	125 mL	28 days
Total Nitrogen (low level)	MCTNP (water)	G	Cool, 4°C	250 mL	28 days
Chlorophyll-*a*	SM10200H Spectrophotometric or Fluorometric Determination	P	Cool, 4°C, dark	500 mL	Samples on filters taken from water having pH 7 or higher may be placed in airtight plastic bags and stored frozen for three weeks. Process samples from acidic water promptly after filtration to prevent possible chlorophyll degradation from residual acidic water on filter.

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Table C-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Analysis [a]	Analytical Methods	Container [b]	Preservation [c,d]	Minimum Sample Volume or Weight [e]	Maximum Holding Time [f]
Algae Identification and Enumeration	20th edition of Standard Methods for the Examination of Water and Wastewater (1998) Section 10200	One-liter precleaned bottle pre-preserved with Lugols solution	Lugols solution with minimum headspace	One-liter	Samples must be received at the laboratory within 24 hours of collection. Samples may be kept in the dark for a maximum of two weeks
Geotechnical Parameters (Grain Size and Atterburg Limits)	ASTM D-422 and ASTM D-4318	As required by the method.	None	500 g	None
Perchlorate	Low-level modified EPA 314.0 (Water)	P or G	Water: Cool, 4°C	Water: 250 mL (volume for EPA Method 314.0 and EPA Method 331.0, in case confirmation needed)	Water: 28 days
Perchlorate	EPA Method 331.0 LC/MS/MS (Water and Soil/Sediment)	P or G	Water: Cool, 4°C Soil/Sediment: Cool, 4°C	Water: 50 mL Soil/Sediment: 100 g	Water and soil/sediment: 28 days

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Notes:

**Soil sample will also be collected in one unpreserved glass container for percent moisture analysis, if EPH soil is not submitted for the same sample. Rev.

a. Samples collected from the same location for analyses that require the same preservation may be combined into one sample container (adequate volume will be submitted) (e.g., metals and hardness; or anions, alkalinity, and TDS/TSS).

b. Polyethylene (P), glass (G)

c. No pH adjustment for solids

d. All temperature preservation requirements are +/- 2 degrees of the temperature specified.

e. Additional volume for QC samples will be submitted as required.

f. Holding times are measured from date of sample collection.

BOD = biological oxygen demand
ºC = degrees Celsius
COD = chemical oxygen demand
EPH = Extractable Petroleum Hydrocarbons
g = grams
HCl = hydrochloric acid
HNO_3 = nitric acid
HPLC = High Performance Liquid Chromatography
H_2SO_4 = sulfuric acid
L = liter
MassDEP = Massachusetts Department of Environmental Protection
mL = milliliter
NA = not applicable
$Na_2S_2O_3$ = sodium thiosulfate
oz. = ounce
QC = quality control
TCLP = Toxicity Characteristic Leaching Procedure
TDS = total dissolved solids
TKN = total kjeldahl nitrogen
TOC = total organic carbon
TS = total solids
TSS = total suspended solids
TVS = total volatile solids
VOC = volatile organic compound
VPH = Volatile Petroleum Hydrocarbons
ZHE = zero headspace extraction

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Table C-8A
Reporting Limits for Method SW846/8270C, Semivolatile Organic Compounds

Analyte	RL (µg/L)
Acenaphthene	5
Acenaphthylene	5
Anthracene	5
Benzo(a)anthracene	5
Benzo(b)fluoranthene	5
Benzo(k)fluoranthene	5
Benzo(g,h,i)perylene	5
Benzo(a)pyrene	5
Bis(2-Chloroethyl)ether	5
Bis(2-Chloroethoxy)methane	5
Bis(2-ethylhexyl) phthalate	5
4-Bromophenyl-phenylether	5
Butylbenzyl phthalate	5
4-Chloroaniline	5
4-Chloro-3-methylphenol	5
2-Chloronaphthalene	5
2-Chlorophenol	5
4-Chlorophenyl-phenylether	5
Chrysene	5
Dibenzo(a,h)anthracene	5
Dibenzofuran	5
3,3'-Dichlorobenzidine	5
2,4-Dichlorophenol	5
Diethylphthalate	5
Dimethyl phthalate	5
2,4-Dimethyphenol	5
Di-n-butyl phthalate	5
4,6-Dinitro-2-methylphenol	25
2,4-Dinitrophenol	25
2,4-Dinitrotoluene	5
2,6-Dinitrotoluene	5
Di-n-octyl phthalate	5
Fluoranthene	5

Table C-8A
Reporting Limits for Method SW846/8270C, Semivolatile Organic Compounds

Analyte	RL (µg/L)
Fluorene	5
Hexachlorobenzene	5
Hexachlorobutadiene	5
Hexachlorocyclopentadiene	5
Hexachloroethane	5
Indeno(1,2,3-cd)pyrene	5
Isophorone	5
2-Methylnaphthalene	5
2-Methylphenol	5
3- / 4-Methylphenol	5
Naphthalene	5
2-Nitroaniline	25
3-Nitroaniline	25
4-Nitroaniline	25
Nitrobenzene	5
2-Nitrophenol	5
4-Nitrophenol	25
N-Nitroso-di-n-propylamine	5
N-Nitrosodiphenylamine	5
2,2'-oxybis(1-Chloropropane)	5
Pentachlorophenol	25
Phenanthrene	5
Phenol	5
Pyrene	5
2,4,6-Trichlorophenol	5
2,4,5-Trichlorophenol	20

Notes:
RL = reporting limit
µg/L = micrograms per liter

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Table C-11
Regulatory Limits* for TCLP Volatiles and Metals

Parameter/Method	Analyte	Regulatory Level	Units
VOCs/SW846/8260B	Benzene	0.5	mg/L
	Carbon tetrachloride	0.5	mg/L
	Chlorobenzene	100.0	mg/L
	Chloroform	6.0	mg/L
	1,2-Dichloroethane	0.5	mg/L
	1,1-Dichloroethene	0.7	mg/L
	Methyl ethyl ketone (MEK)	200.0	mg/L
	Tetrachloroethene (PCE)	0.7	mg/L
	Trichloroethene (TCE)	0.5	mg/L
	Vinyl chloride	0.2	mg/L
Metals/SW846/6010B,7000A Series	Arsenic	5.0	mg/L
	Barium	100.0	mg/L
	Cadmium	1.0	mg/L
	Chromium	5.0	mg/L
	Lead	5.0	mg/L
	Mercury	0.2	mg/L
	Selenium	1.0	mg/L
	Silver	5.0	mg/L

Notes:

The TCLP extraction procedures are to be performed by method analytical method SW-846 1311. After extraction is performed, refer to the SW-846 8260 and/or the SW-846 6010B/7000 series tables for QC requirements for relative analytes.

*Reporting limits need to be equal to or less than the regulatory limits.

mg/L = milligrams per liter

TCLP = Toxicity Characteristics Leaching Procedure

VOCs = volatile organic compounds

Table C-6B
Reporting Limits for Extractable Petroleum Hydrocarbons, MassDEP Method*

Analyte	Water		Soil/Sediment	
	RL	Unit	RL	Unit
2-Methylnaphthalene	0.5	µg/L	0.5	mg/kg
Acenaphthene	0.5	µg/L	0.5	mg/kg
Acenaphthylene	0.5	µg/L	0.5	mg/kg
Anthracene	0.5	µg/L	0.5	mg/kg
Benzo(a)anthracene	0.1	µg/L	0.5	mg/kg
Benzo(a)pyrene	0.1	µg/L	0.5	mg/kg
Benzo(b)fluoranthene	0.1	µg/L	0.5	mg/kg
Benzo(g,h,i)perylene	0.1	µg/L	0.5	mg/kg
Benzo(k)fluoranthene	0.1	µg/L	0.5	mg/kg
Chrysene	0.1	µg/L	0.5	mg/kg
Dibenzo(a,h)anthracene	0.1	µg/L	0.5	mg/kg
Fluoranthene	0.5	µg/L	0.5	mg/kg
Fluorene	0.5	µg/L	0.5	mg/kg
Indeno(1,2,3-cd)pyrene	0.1	µg/L	0.5	mg/kg
Naphthalene	0.5	µg/L	0.5	mg/kg
Phenanthrene	0.5	µg/L	0.5	mg/kg
Pyrene	0.5	µg/L	0.5	mg/kg
C11-C22 Aromatic Hydrocarbons	150	µg/L	30	mg/kg
C19-C36 Aliphatic Hydrocarbons	500	µg/L	30	mg/kg
C9-C18 Aliphatic Hydrocarbons	500	µg/L	30	mg/kg

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*The MassDEP Method will be followed for the soil and water extractable petroleum hydrocarbon analyses.

Notes:
MassDEP = Massachusetts Department of Environmental Protection
mg/kg = milligrams per kilogram
RL = reporting limit
µg/L = micrograms per liter

Table C-3A
Reporting Limits for Method SW846/8260B, Volatile Organic Compounds

Analyte	Water		Soil/Sediment	
	RL	Unit	RL	Unit
Benzene #	1	µg/L	5	µg/kg
Bromochloromethane	1	µg/L	5	µg/kg
Bromodichloromethane	1	µg/L	5	µg/kg
Bromoform	1	µg/L	5	µg/kg
Bromomethane	2	µg/L	10	µg/kg
Carbon tetrachloride #	1	µg/L	5	µg/kg
Chlorobenzene	1	µg/L	5	µg/kg
Chloroethane	1	µg/L	10	µg/kg
Chloroform	1	µg/L	5	µg/kg
Chloromethane	1	µg/L	10	µg/kg
cis-1,2-Dichloroethene #	1	µg/L	5	µg/kg
trans-1,2-Dichloroethene #	1	µg/L	5	µg/kg
cis-1,3-Dichloropropene	1	µg/L	5	µg/kg
trans-1,3-Dichloropropene	1	µg/L	5	µg/kg
Dibromochloromethane	1	µg/L	5	µg/kg
1,2-dibromo-3-chloropropane (DBCP)	2	µg/L	10	µg/kg
1,2-Dichlorobenzene	1	µg/L	5	µg/kg
1,3-Dichlorobenzene	1	µg/L	5	µg/kg
1,4-Dichlorobenzene	1	µg/L	5	µg/kg
1,1-Dichloroethene #	1	µg/L	5	µg/kg
1,1-Dichloroethane	1	µg/L	5	µg/kg
1,2-Dibromoethane (ethylene dibromide or EDB)	1	µg/L	5	µg/kg
1,2-Dichloroethane	1	µg/L	5	µg/kg
1,2-Dichloropropane	1	µg/L	5	µg/kg
Ethylbenzene #	1	µg/L	5	µg/kg
Methylene chloride	2	µg/L	5	µg/kg
Methyl tert-butyl ether (MTBE)	1	µg/L	5	µg/kg
Styrene	1	µg/L	5	µg/kg
Tetrachloroethene (PCE) #	1	µg/L	5	µg/kg
Trichloroethene (TCE) #	1	µg/L	5	µg/kg
1,1,2,2-Tetrachloroethane	1	µg/L	5	µg/kg
1,2,4-Trichlorobenzene	2	µg/L	10	µg/kg
1,1,1-Trichloroethane #	1	µg/L	5	µg/kg
1,1,2-Trichloroethane	1	µg/L	5	µg/kg
1,2,4-Trimethylbenzene *	1	µg/L	5	µg/kg
1,3,5-Trimethylbenzene *	1	µg/L	5	µg/kg
Toluene #	1	µg/L	5	µg/kg
Vinyl chloride	1	µg/L	10	µg/kg
m,p-xylenes #	2	µg/L	10	µg/kg
o-xylene #	1	µg/L	5	µg/kg

Notes:
Analyte is a spike analyte for LCS and MS/MSD analyses.
* To be analyzed upon request.
LCS = laboratory control sample
MS/MSD = matrix spike/matrix spike duplicate
RL = reporting limit
µg/kg = micrograms per kilogram
µg/L = micrograms per liter

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Table C-6A
Reporting Limits for Volatile Petroleum Hydrocarbons, MassDEP Method*

Analyte	Water		Soil/Sediment	
	RL	Unit	RL	Unit
Methyl tert-butyl ether	5	µg/L	0.1	mg/kg
Benzene	1	µg/L	0.1	mg/kg
Toluene	5	µg/L	0.1	mg/kg
Ethylbenzene	5	µg/L	0.1	mg/kg
m,p-Xylenes	5	µg/L	0.1	mg/kg
o-Xylene	5	µg/L	0.1	mg/kg
Naphthalene	5	µg/L	0.5	mg/kg
C5-C8 Aliphatic Hydrocarbons	20	µg/L	1	mg/kg
C9-C10 Aromatic Hydrocarbons	20	µg/L	1	mg/kg
C9-C12 Aliphatic Hydrocarbons	20	µg/L	1	mg/kg

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*The Mass DEP Method will be followed for the soil and water volatile petroleum hydrocarbon analyses.

Notes:
MassDEP = Massachusetts Department of Environmental Protection
RL = reporting limit
µg/L = micrograms per liter
µg/kg = micrograms per kilogram

Table C-19A
Reporting Limits for Wet Chemistry Methods

Water Quality Parameters	Method	Reporting Limit	Units
Alkalinity	E310.1	20	mg/L
BOD	E405.1	2	mg/L
COD	E410.4	8	mg/L
Hardness ($CaCO_3$)	E130.1, E130.2	10	mg/L
N, Ammonia	E350.1; E350.2	0.1	mg/L
N, Nitrate	E352 series	0.1	mg/L
N, Nitrate/Nitrite	E353 series	0.1	mg/L
Nitrogen, Kjeldahl Total	E351 series	0.3	mg/L
Orthophosphate	E365 series	0.1	mg/L
Sulfide	E376.1	2.0	mg/L
TDS	E160.1	10	mg/L
TOC, DOC, DIC	E415.1; E415.2	1	mg/L
TOC (soil/sediment)	SW9060	2000	mg/kg
Total Solids	E160.3	10	mg/L
Total Phosphorous	E365 series	0.1	mg/L
Total Phosphorous	E365 series	10	mg/kg
Total Volatile Solids	E160.4	10	mg/L
TSS	E160.2	5	mg/L

Notes:
BOD = biological oxygen demand
$CaCO_3$ = calcium carbonate
COD = chemical oxygen demand
DIC = dissolved inorganic carbon
DOC = dissolved organic carbon
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
TDS = total dissolved solids
TOC = total organic carbon
TSS = total suspended solids